

undersigned counsel and the Examiner upon the Examiner reaching this case and doing a preliminary review of this Response. The Examiner is requested to contact counsel at 360 – 681 – 7305 to arrange a time mutually convenient to discuss the issues presented by this Response or resolve any remaining open issues.

REMARKS

Reexamination and reconsideration of this application is respectfully requested in view of the amendments to the claims and these remarks.

By way of the status of claims of the case, please consider the following summary:

The case was filed with 30 claims, with 4 independent (main) claims: 1, 11, 17 and 30. This Response cancels 12 claims and adds 23 for a total of 41 claims, of which there are 7 independent (main) claims: 1, 11, 17, 30 (same as the original), and new main independent claims 31, 41 and 53.

Thus the claims in the case are as follows:

Set 1, Main claim 1 and dependent claims 2 – 4, 6, 7, and 47 – 49 (9 claims total);

Set 2, Main claim 11 and dependent claims 12 – 14, 50 and 51 (6 claims total);

Set 3, Main claim 17 and dependent claims 18, 21- 24, 28 and 52 (8 claims total);

Set 4, Main claim 30, no dependent claims (1 claim total);

Set 5, New Main claim 31 and dependent claims 32 – 40 (10 claims total);

Set 6, New Main claim 41 and dependent claims 42 – 46 (6 claims total); and

Set 7, New Main claim 53, no dependent claims (1 claim total).

Sets 1, 2, 5 and 7 are directed to methods, and Sets 3, 4 and 6 are directed to apparatus.

The amendments to the Specification are corrections of obvious typographical errors and insertion on pages 6 and 7 of the update to the cross-reference to the now-issued Seip et al patent relating to Transducer Temperature Compensation; no new matter has been added.

The amendments to the Claims more clearly recite features of the inventions of this case and no new matter has been added as can be seen by careful review of the Specification. In the following discussion, references to support language in the Specification by page and line is exemplary only in order to not overburden the record of this case, and such exemplary citations are not intended to be the exclusive basis for support.

Claim 5 was canceled in favor of inserting its determination step into Claim 1, step a. The remaining Claim 1 amendments clarify the extraction of temperature data from the US output and the triggering occurring upon determination of the occupancy state, see page 4, lines 16 – 21 and

page 9, line 28 through page 10, line 2, and elsewhere throughout the Specification for the support. As noted throughout the Specification, the inventions in one aspect have as a significant feature the single sensor signal analysis for both occupancy state and temperature. None of the references teach or suggest extracting temperature data from a US sensor output.

Claims 2 and 22 have been amended and Claims 32 and 53 have been added to recite several vehicle stopped conditions; this is supported at page 5, lines 7 – 14 of the Specification and page 8, lines 16 - 20. As to the amendment to Claim 4, reference to checking the occupancy history is found at page 5, line 16 and elsewhere in the Specification such as page 11, line 29 and page 13, line 2.

Claim 7 has been amended by incorporation of the limitations of Claims 8 – 10, which in turn have been canceled. Since Claims 8 – 10 are original claims, no new matter has been added.

New Claims 47 – 49 are dependent on main independent claim 1. Claim 47 is supported at page 15, lines 4 – 6 and page 14, lines 1 and 2. Claim 48 is supported at page 6, lines 28 – 31. Claim 49 is supported at page 7 lines 3 – 7, and page 6, lines 11 – 21.

The amendments to Claim 11 add the recitation in step d) of extraction of temperature data from a US sensor output data as in original Claim 5. The predetermined criteria recitation is out of original Claim 1. No new matter has been added.

Claims 15 and 16 were incorporated into steps b) and c) of claim 14, so they were canceled as redundant. No new matter has been added.

Claims 50 and 51 are the same as claims 47 and 48 respectively, as dependent on claim 11. Support is as described above.

Claim 17 more clearly recites that the sensor is an ultrasound (US) unit, and specifies the controller and its signal processing algorithm for extraction of temperature data from the US input. The controller is element 12 in the figures. See also the accompanying text at page 11, lines 2 – 16, 24, page 11, line 29 for the database, page 12, line 31 through page 13, line 2, page 13, line 11 and page 13, lines 15 – 18, page 14, lines 11, 12, 20, 27 and 28, and page 15, line 26 for the progressive activation of activities by the controller from signal inputs. The recitation of the response of the controller to the predetermined temperature criteria is from claim 20 which has been canceled. Claim 19 was cancelled as redundant, and claim 29 was incorporated into claim 17 element b). No new matter has been added, and recitation of the controller as a positive element of the apparatus combination clarifies the invention.

For the recitation of the vehicle conditions in Claim 22, this parallels Claim 2; see the support for that language above. Claim 24 incorporates the language of original claims 25 – 27, so those latter claims have been canceled, and no new matter has been added.

New Claim 52, dependent on Claim 28, is supported at page 9, lines 2 – 13, and has been added to round out the scope of protection of the inventive features set forth in the Specification.

New claim Set 5, Method Claims 31 – 40 are added to round out the scope of protection, and feature method step for the release of occupants, not shown or suggested in the art cited. The dependent claims parallel the claims of the Sets 1 and 2. No new matter has been added.

New claim Set 6, Apparatus Claims 41 – 46 are added to round out the scope of protection and feature apparatus for the release of occupants, including a temperature sensor, a controller including a control algorithm and a release activator, not shown or suggested in the art cited. The dependent claims parallel the claims of Set 3. No new matter has been added.

Finally, new Claim 53 has been added to round out the scope of protection covering the RF signals out in event of flooded, submerged, inverted or wrecks of the vehicle. This is supported at page 19, lines 3 – 8.

Response to the Section 102 Rejections:

Claims 1 – 30 as originally filed have been rejected as fully met by Liu, 6,263,272, and claims 1 – 8, 11 – 14, 17 – 25 and 28 – 30 have been rejected as fully met over Rice, 6,028,509. Both these rejections are inappropriate and should be withdrawn. Neither of these references, or any of the others cited for that matter, are directed to the evaluation of the output of an ultrasound (US) sensor to determine the temperature, nor do they call for release of the occupants.

Indeed, for example, it was completely inappropriate to apply Liu to the rejection of claims 5, 10 and 16 that clearly called for the extraction of temperature data from the US and for release, respectively. To the extent that the original main claim 1 and its dependent claims 2 - 10, claims 13 – 16, 23 – 27, 29 and 30 cover the release of passengers/occupants, the rejection was inappropriate.

Contrary to the assertion on page 3 of the Detailed Action, Liu does NOT, in column 7 (or anywhere else for that matter), disclose “The temperature can be monitored using an ultrasound sensor.” That is the discovery of Dr. Seip and Russell Watts as set forth in copending application SN 09/325,242, now US Patent 6,314,380, as referenced on pages 6 and 7 of the Specification of

this case, and incorporated by reference. It is clear that the rejection simply treated the original claims with a broad brush and did not appreciate the dual use of the sensor signal, for both occupancy status and temperature data extraction by the controller algorithm, a software solution, as well as the added control function of occupant release. The rejection should be withdrawn.

As to Rice, the Office Action concedes that this reference does not disclose either relief measures or release measures. As noted above in connection with Liu, Rice does not show extraction of temperature data from the output of a US sensor for any purpose. Accordingly the rejection of claims 1 – 8, 11 – 14, 17 – 25 and 28 – 30 should be withdrawn.

Response to Section 103 Rejection:

It was not made clear on page 4 of the Detailed Action which claims are rejected over Rice in view of Wenhart, 5,222,661, but it will be assumed that all the original claims 1 – 30 were rejected as obvious combinations of those two references. This rejection is inappropriate and should be withdrawn.

It is clear that the claims were treated with a broad brush in the rejection. Wenhart does not cure the defects noted above in Rice. Wenhart nowhere discloses the release of occupants from a hot car. Indeed, when the ignition is off, the Wenhart air conditioning system is disabled. That is when children die of suffocation in hot vehicles. Wenhart is directed to the convenience of the operator in automatic operation of the air conditioning system during driving, so that the driver is not distracted from observing the road by fiddling with the AC controls. Wenhart is not concerned with child or disabled adult heat prostration safety when the driver is absent from the vehicle and the ignition is off. There is no teaching or suggestion in either reference pointing to the other, nor would one cure the defects of the other.

The Amended and New Claims are Patentable Over the References:

Please note that all the claims in the case now more clearly distinguish over Liu, Rice and Wenhart, 5,222,661 and are patentable thereover.

Set 1, method claims 1 – 4, 6, 7 and 47 – 49 clearly set forth the step of determining the occupancy state of a vehicle interior space including evaluating data extracted from a sensor system employing an ultrasound sensor, and triggering at least one of an interior or exterior alert, a heat relief measure and a passenger release measure. None of the references even dream that T data can

be extracted from a US sensor.

Set 2, claims 11 – 14, 50 and 51 are directed to alert methods only, but clearly call for the step of monitoring the temperature in the vehicle space by extraction of temperature data from the output of at least one ultrasound transducer, again not taught or suggested by the references.

Set 3, claims 17, 18, 22 – 24, 28 and 52 are directed to apparatus for reminding or warning against heat prostration conditions including a US transponder and a controller having a signal processing algorithm for extraction of temperature data from said US unit input signal, again not taught or suggested by the references. Indeed, none of the reference discuss decision or detection algorithms, and as such are mere invitations to experiment, defective at critical points of enabling disclosure.

Set 4, claim 30 is directed to computer readable media storing computer executable instructions that when executed by a processor, such as in the controller 12 disclosed in the Applicants' Specification, carries out the method of claim 1. This claim clearly distinguishes over the references, as they do not carry out the temperature extraction analysis step of claim 1, hence the instruction/data structure of claim 30 cannot be taught or suggested by the references.

Set 5, new claims 31 – 40 are directed to improved methods of reducing danger to vehicular occupants from heat prostration or suffocation in hot closed vehicles calling for triggering a release measure in response to an excess temperature signal. Applicants' analysis of the references has not shown attention to true release measures, such as seat belt release, unlocking the door or trunk, unlocking or fully opening a window or roof panel and deploying a ramp or lift.

Set 6, new apparatus claims 41 – 46 are directed to apparatus system for release of passengers including passenger release activators connected to the controller for releasing at least one of a passenger/animal restraint or unlocking or opening an exit or escape passage, not shown or suggested by the references.

Set 7, new method claim 53 is directed to the RF alert **AND** passenger release upon a sensed condition of flooding, submergence, inversion or wreck, situations not addressed by the references, as disclosed on page 19 of the Specification.

It is clear that the amended and new claims clearly and patentably distinguish over the references applied, as well as the remaining references cited but not applied: Barnett 4,851,822,

Dombrowski 5,311,746 and Teague 5,793,284.

CONCLUSION


Applicants have carefully reviewed the Office Action and responded fully to all aspects thereof, including amendments to more clearly point out and describe the invention and submission of new claims to more adequately cover a full suite of aspects of the inventions disclosed. It is clear that the references do not teach or suggest the claimed inventions, either taken alone or in combination. Favorable action of allowance of all claims present in the case is respectfully urged.

The Examiner is requested to contact undersigned counsel at the number indicated to resolve any issues relating to this Response.

Respectfully submitted,
Jacques M. Dulin, et al.

Date: October 14, 2002

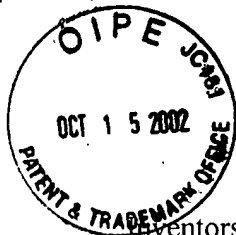
by:


Jacques M. Dulin, Reg. No. 24,067
Attorney for Applicant(s)

Innovation Law Group, Ltd.
Transforming Ideas Into Business Assets®
271 S. 7th Avenue, Suite 24
Sequim, WA 98382-3652
Phone 360 681 - 7305
Fax 360 681 - 7315

e-mail: Dulin@InnovationLaw.com

encl: a) Set of Amended, Cancelled and
New Claims for SN 09/845,016 (11 pp)
b) Copy of cover page 6,314,380
c) Post card to acknowledge receipt
Via Express Mail



10-16-02

Atty. Docket 24347-051US
USSN 09,845,016

3661/\$

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors: **Jacques M. Dulin, et al.**

Examiner: **Jacques H Louis-Jacques**

Application SN: **09/845, 016**

GAU: **3661**

Date Filed: **April 27, 2001**

Tel: **703 - 305 - 9757**

For: **HOT VEHICLE SAFETY SYSTEM AND METHODS OF PREVENTING
PASSENGER ENTRAPMENT AND HEAT SUFFOCATION**

EXPRESS MAIL No.: **EV 184 581 971 US** Date Mailed: **October 15, 2002**

Amended, Cancelled and New Claims for SN 09/845,016

RECEIVED
OCT 21 2002
GROUP 3500

1) **(Amended)** Method for reducing the danger to vehicular passengers and animals of heat prostration or suffocation upon being trapped in a hot, closed vehicle comprising the steps of:

a) **determining the occupancy state of a vehicle interior space, including evaluating data extracted from a sensor system employing an ultrasound unit;**

b) monitoring the temperature of at least one of a vehicle interior space and the exterior ambient temperature **by extracting temperature data from at least one output of said ultrasound unit;**

c) [b)] triggering at least one of an interior alert, an exterior alert, a heat relief measure, and a passenger release measure in response to **said vehicle interior space occupancy state being determined as occupied, and in response to** the monitored temperature satisfying a predetermined criteria.

2) **(Amended)** Method as in claim 3 [1] which includes the step of:

a) sensing a vehicle **stopped** condition selected from vehicle ignition state, **vehicle accelerometer activity or history, vehicle electrical system activity [stopped], odometer activity, amount of road vibration, GPS location updates, engine activity, external motion sensing, trunk or** door open/closed, parking brake on, and occupancy state **history;** and wherein said triggering **includes evaluating [is in response to]** said sensed **vehicle** condition **[and said temperature satisfying predetermined criteria].**

3) **(Amended)** Method as in claim 1 [2] wherein said temperature monitored is

the temperature of at least one vehicle interior space selected from a passenger compartment and a load space.

4) **(Amended)** Method as in claim 3 wherein said occupancy state sensing steps includes the step of evaluating the output of at least one **additional** sensor selected from an ultrasound sensor, an IR sensor, an imaging sensor, a microphone, a seat sensor, a capacitance sensor, a motion sensor, and a floor sensor, **or the occupancy history**.

CANCEL CLAIM 5 IN FAVOR OF AMENDED CLAIM 1:

[5) Method as in claim 1 wherein said temperature monitoring steps includes extracting temperature data from an ultrasound sensor.]

6) Method as in claim 1 which includes the steps of progressively triggering at least two of said interior warning, said exterior warning, said passenger/animal relief and said passenger/ animal release.

7) **(Amended)** Method as in claim 6 wherein;

a) said step[s] of triggering said interior warning includes activating at least one of a voice announcement, a warning sound, and an illuminated warning[.];

b) said step of triggering said exterior warning includes activating at least one of vehicle lights, sounding a vehicle horn, sounding an alarm system siren, and an outbound RF message;

c) said step of triggering said passenger/animal relief includes activating at least one of opening at least one window or roof panel, turning on a fan, turning on a vehicle AC system, deploying shading, increasing reflectivity, and providing location information to rescuers; and

d) said step of triggering said passenger/animal release includes activating at least one of a seat belt release, unlocking a door, opening a window or roof panel and deploying a ramp or lift.

CANCEL CLAIMS 8 – 10 IN FAVOR OF AMENDED CLAIM 7:

[8) Method as in claim 6 wherein said step of triggering said exterior warning includes activating at least one of vehicle lights, sounding a vehicle horn, sounding an alarm system siren, and an outbound RF message.]

[9) Method as in claim 6 wherein said step of triggering said passenger/animal relief includes activating at least one of opening at least one window or roof panel, turning on a fan, turning on a vehicle AC system, deploying shading, increasing reflectivity, and providing location information to rescuers.]

[10) Method as in claim 6 wherein said step of triggering said passenger/animal release includes activating at least one of a seat belt release, unlocking a door, opening a window or roof panel and deploying a ramp or lift.]

PLEASE ADD NEW CLAIMS 47, 48 AND 49 HERE:

47) Method as in claim 1 wherein said predetermined temperature criteria include at least one of absolute temperature value and rate of temperature rise over time.

48) Method as in claim 47 wherein the frequency of extraction of temperature data from said ultrasound unit output increases when the absolute temperature of said vehicle interior space reaches a preselected value.

49) Method as in claim 47 wherein at least one of said triggerings occurs when the vehicle is detected as not running and a door, trunk lid or load compartment access door is detected as sequencing open/close, said ultrasound unit is awakened to monitor at least one of interior and exterior temperature for said triggering determination, in part to protect against "crawl-in" type entrapment of children.

11) (Amended) Method for providing an alert to assist in avoiding development of a heat condition in the interior of a vehicle that is dangerous to non-abled human and animal occupants, comprising the steps of:

- a) providing a reminder device for the vehicle driver and able passengers of the presence of non-abled vehicle occupants,
- b) arming said reminder device upon inclusion of at least one non-abled occupant in said vehicle;
- c) sensing a condition of at least one of said driver or an able passenger leaving said vehicle, vehicle ignition OFF after a period of ignition ON, vehicle stopped, and at

least one of the driver and an able passenger door opening or/and closing; [and]

d) monitoring the temperature in the vehicle space in which said non-abled vehicle occupant is located by extraction of temperature data from the output of at least one ultrasound transducer; and

e) [d)] triggering said reminder upon both said monitored temperature satisfying a predetermined criteria and at least one of said sensed conditions occurring so that **said** reminder **device** can alert at least one of said driver and said able passenger to not leave said non-abled occupant untended in the vehicle to suffer from heat-induced injury.

12) Method as in claim 10 wherein said alert is selected from at least one of a light, a lighted message, a sound alarm and a voice announcement.

13) Method as in claim 11 which includes the added step of triggering at least one of an exterior alert, a heat relief measure and a release measure in response to at least one of said sensed conditions occurring.

14) (Amended) Method as in claim 13 wherein;

a) said step of triggering said exterior warning includes activating at least one of vehicle lights, sounding a vehicle horn, sounding an alarm system siren, and an outbound RF message[.];

b) said step of triggering said passenger/animal relief includes activating at least one of opening at least one window or roof panel, turning on a fan, turning on a vehicle AC system, deploying shading, increasing reflectivity, and providing location information to rescuers; and

c) said step of triggering said passenger/animal release includes activating at least one of a seat belt release, unlocking a door or trunk, unlocking or opening a window or roof panel and deploying a ramp or lift.

CANCEL CLAIMS 15 AND 16 IN FAVOR OF AMENDED CLAIM 14:

[15) Method as in claim 13 wherein said step of triggering said passenger/animal relief includes activating at least one of opening at least one window or roof panel, turning on a fan, turning on a vehicle AC system, deploying shading, increasing reflectivity, and providing location information to rescuers.]

[16) Method as in claim 13 wherein said step of triggering said passenger/animal release includes activating at least one of a seat belt release, unlocking a door, opening a window or roof panel and deploying a ramp or lift.]

PLEASE ADD NEW CLAIMS 50 AND 51 HERE:

50) Method as in claim 11 wherein said predetermined temperature criteria include at least one of absolute temperature value and rate of temperature rise over time.

51) Method as in claim 50 wherein the frequency of extraction of temperature data from said ultrasound unit output increases when the absolute temperature of said vehicle interior space reaches a preselected value.

17) (Amended) Apparatus system for reminding or warning against development of excess heat conditions in vehicle passenger and/or load spaces, comprising in operative combination:

a) at least one temperature sensor for monitoring **the ambient temper-ature of** at least one of a vehicle interior space and the exterior [**ambient temperature**], **comprising at least one ultrasound transponder unit;**

b) **a controller which includes a signal processing algorithm for extraction of temperature data from an input from said ultrasound transponder unit, a state and temperature history database, and a control algorithm including a set of temperature criteria for at least one of reminder and warning activation triggers;**
and

c) at least one warning device mounted in association with said vehicle **triggered by said controller in response to the monitored temperature satisfying a predetermined criteria,** for at least one of:

i) reminding against leaving a non-abled passenger or animal in the vehicle; and

ii) warning of at least one sensed temperature condition exterior or interior of said vehicle that tends toward danger for a non-abled passenger or animal in said vehicle space[;].

18) System as in claim 17 wherein said warning device comprises an initializable

sound or visual reminder unit electrically linked to at least one vehicle door open/close sensor, so that after initializing, upon said vehicle door being sensed as opened or/and closed, said reminder unit warning is activated.

PLEASE CANCEL CLAIMS 19 AND 20 AS REDUNDANT:

[19) System as in claim 18 wherein said reminder unit includes means for manual initialization.]

[20) System as in claim 18 wherein said reminder unit is initialized in response to a predetermined temperature being sensed.]

21) System as in claim 17 wherein said warning device is responsive to a predetermined temperature being sensed.

22) (Amended) System as in claim 21 wherein:

a) said system includes [c)] at least one vehicle stopped condition sensor that provides an output to said controller of at least one of vehicle ignition state, vehicle accelerometer activity or history, vehicle electrical system activity [stopped], odometer activity, amount of road vibration, GPS location updates, engine activity, external motion sensing, trunk or door open/close, parking brake on[.], and occupancy state;

b) [d] said [a] controller evaluates [for evaluating] said temperature sensed and said vehicle condition output; and

c) said controller, in response to evaluation by said algorithm that at least one preselected set of temperature and vehicle conditions has been met, triggers said warning device.

23) System as in claim 22 wherein said controller progressively triggers at least two of an interior vehicle warning, an exterior warning, a passenger/animal relief measure and a passenger/animal release measure.

24) (Amended) System as in claim 23 wherein:

a) said interior warning is selected from a voice announcement, a warning sound, and an illuminated warning[.];

b) said exterior warning is selected from flashing vehicle lights, sounding a

horn, sounding an alarm system siren, and an RF call out;

c) said passenger/animal relief is selected from opening at least one window or roof panel, turning on a fan, turning on a vehicle AC system, deploying shading, darkening or increasing reflectivity of windows, and providing location information to rescuers; and

d) said passenger/animal release is selected from disconnecting a seatbelt, unlocking a door, opening a window or roof panel, opening a door, and deploying a ramp or lift.

CANCEL CLAIMS 25 – 27 IN FAVOR OF AMENDED CLAIM 24:

[25) System as in claim 23 wherein said exterior warning is selected from flashing vehicle lights, sounding a horn, sounding an alarm system siren, and an RF call out.]

[26) System as in claim 23 wherein said passenger/animal relief is selected from opening at least one window or roof panel, turning on a fan, turning on a vehicle AC system, deploying shading, darkening or increasing reflectivity of windows, and providing location information to rescuers.]

[27) System as in claim 23 wherein said passenger/animal release is selected from disconnecting a seatbelt, unlocking a door, opening a window or roof panel, opening a door, and deploying a ramp or lift.]

28) (Amended) System as in claim 22 wherein said vehicle condition occupancy state sensor comprises at least one of an ultrasound sensor, an [1]IR sensor, an imaging sensor, a microphone, a seat sensor, a floor sensor, a capacitance sensor, and a motion sensor.

CANCEL CLAIM 29 IN FAVOR OF AMENDED CLAIM 17:

[29) System as in claim 23 wherein interior passenger space temperature data is extracted from the return signal output from said ultrasound sensor.]

PLEASE ADD NEW CLAIM 52 HERE:

52) System as in claim 28 wherein said occupancy state sensor comprises a linear array of transducers, and the input to the controller therefrom is selectively

evaluated for at least one of a Head Zone, a seat zone, a floor zone and side scan for window position.

30) A computer readable media storing computer executable instructions that, when executed by at least one processor, performs the method of claim 1.

PLEASE ADD NEW CLAIMS 31 – 46 AND 53 HERE:

31) In a method of reducing the danger to vehicular passengers and animals of heat prostration or suffocation upon being trapped in a hot, closed vehicle, in which interior temperature of an occupied vehicle is sensed, and in response to said temperature an excessive temperature warning signal is generated, the improvement comprising the step of triggering a release measure in response to said excess temperature signal.

32) Improved method as in claim 31 which includes the step of:

a) sensing a vehicle stopped condition selected from vehicle ignition state, vehicle accelerometer activity or history, vehicle electrical system activity, odometer activity, amount of road vibration, GPS location updates, engine activity, external motion sensing, trunk or door open/closed, parking brake on, and occupancy state history; and wherein said passenger release triggering includes evaluating said sensed vehicle condition.

33) Improved method as in claim 32 wherein said temperature monitored is the temperature of at least one vehicle interior space selected from a passenger compartment and a load space.

34) Improved method as in claim 33 wherein said occupancy state sensing steps includes the step of evaluating the output of at least one sensor selected from an ultrasound sensor, an IR sensor, an imaging sensor, a microphone, a seat sensor, a capacitance sensor, a motion sensor, and a floor sensor.

35) Improved method as in claim 31 wherein said temperature monitoring step includes extracting temperature data from an ultrasound sensor.

36) Improved method as in claim 31 which includes the steps of progressively triggering at least one of an interior warning, an exterior warning, and a passenger/animal relief measure, followed by triggering said passenger/animal

release.

37) Improved method as in claim 36 wherein;

a) said step of triggering said interior warning includes activating at least one of a voice announcement, a warning sound, and an illuminated warning;

b) said step of triggering said exterior warning includes activating at least one of vehicle lights, sounding a vehicle horn, sounding an alarm system siren, and an outbound RF message;

c) said step of triggering said passenger/animal relief includes activating at least one of opening at least one window or roof panel, turning on a fan, turning on a vehicle AC system, deploying shading, increasing reflectivity, and providing location information to rescuers; and

d) said step of triggering said passenger/animal release includes activating at least one of a seat belt release, unlocking a door or trunk, unlocking or opening a window or roof panel and deploying a ramp or lift.

38) Improved method as in claim 31 wherein said predetermined temperature criteria include at least one of absolute temperature value and rate of temperature rise over time.

39) Improved method as in claim 38 wherein the frequency of extraction of temperature data from said ultrasound unit output increases when the absolute temperature of said vehicle interior space reaches a preselected value.

40) Improved method as in claim 38 wherein at least one of said triggerings occurs when the vehicle is detected as not running and a door, trunk lid or load compartment access door is detected as sequencing open/close, said ultrasound unit is awakened to monitor at least one of interior and exterior temperature for said triggering determination, in part to protect against "crawl-in" type entrapment of children.

41) Apparatus system for reducing the danger to vehicular passengers and animals of heat prostration or suffocation upon being trapped in a hot, closed vehicle comprising in operative combination:

a) at least one temperature sensor for monitoring at least one of a vehicle

interior space and the exterior ambient temperature;

b) a controller receiving an output of said temperature sensor, a state and temperature history database, and a control algorithm including a set of temperature criteria for triggering at least one passenger/animal release measure in response to a predetermined temperature being sensed; and

c) at least one passenger/animal release activator connected to said controller for releasing at least one of a passenger/animal restraint or unlocking or opening an exit or escape passage.

42) Apparatus system as in claim 41 wherein said release activator includes at least one of a seat belt release, a door or trunk lock, a window or roof panel opener and a ramp or lift deploy unit.

43) Apparatus system as in claim 41 which includes at least one vehicle stopped condition sensor that provides an output to said controller of at least one of vehicle ignition state, vehicle electrical system activity, odometer activity, amount of road vibration, GPS location updates, engine activity, external motion sensing, trunk or door open/close, parking brake on, and occupancy state.

44) Apparatus system as in claim 43 wherein;

a) said controller algorithm progressively triggers at least one of an interior vehicle warning, an exterior warning, a passenger/animal relief measure, followed by said passenger/animal release activator;

b) wherein said interior warning is selected from actuators for a voice announcement, a warning sound, and an illuminated warning;

c) said exterior warning is selected from actuators for flashing vehicle lights, sounding a horn, sounding an alarm system siren, and an RF call out; and

d) said passenger/animal relief is selected from actuators for opening at least one window or roof panel, turning on a fan, turning on a vehicle AC system, deploying shading, darkening or increasing reflectivity of windows, and providing location information to rescuers.

45) Apparatus system as in claim 43 wherein said occupancy state sensor comprises at least one of an ultrasound sensor, an IR sensor, an imaging sensor, a

microphone, a seat sensor, a floor sensor, a capacitance sensor, and a motion sensor, and said interior passenger space temperature data is extracted from the return signal output from said ultrasound sensor.

46) System as in claim 28 wherein said occupancy state sensor comprises a linear array of transducers, and the input to the controller therefrom is selectively evaluated for at least one of a Head Zone, a seat zone, a floor zone and side scan for window position.

53) Method of assisting in the location and release of occupants from vehicles involved in flooding, submerges, inversions or wrecks comprising the steps in any operative sequence of:

a) sensing a vehicle condition selected from vehicle accelerometer activity or history, water flooding or submerged conditions, crush or wreck condition, vehicle stopped, vehicle ignition state, vehicle electrical system activity, odometer activity, amount of road vibration, GPS location updates, engine activity, external motion sensing, trunk or door open/closed, parking brake on, and occupancy state or state history; and

b) triggering at least one of a passenger release measure and an external RF message to rescue/emergency personnel in response to evaluating said sensed vehicle condition.